

How to achieve bidirectional control in energy storage power stations





Overview

Are AC CPL stability control strategies suitable for a bidirectional energy storage converter?

In order to fill this gap, this paper proposes stability control strategies for bidirectional energy storage converters considering the characteristics of AC CPLs to guarantee large signal stability of islanded AC microgrids.

What is bidirectional power flow control?

Therefore, bidirectional power flow control strategies are proposed to achieve the maximum PV power utilization as well as to realize the hybrid charging methods. In addition, with the proposed strategies, the bidirectional charging/discharging capability of the battery is able to achieve the maximum PV power utilization.

How can bidirectional charging/discharging a battery achieve maximum PV power utilization?

In addition, with the proposed strategies, the bidirectional charging/discharging capability of the battery is able to achieve the maximum PV power utilization. All the proposed strategies can be realized by the digital signal processor without adding any additional circuit, component, and communication mechanism.

Can energy storage power stations be controlled again if blackout occurs?

According to the above literature, most of the existing control strategy of energy storage power stations adopt to improve the droop control strategy, which has a great influence on the system stability and cannot be controlled again in case of blackout.

What is the stability control strategy in a DC/DC converter?

The stability control strategy in (29) indicates the relationships among AC CPLs power P , storage discharging power P_b , micro power source power P_G ,



outer voltage loop control parameters, $k_p(d)$ of the outer voltage loop control parameter of the DC/DC converter, and $k_{ip}(d)$ of the inner current loop control parameters of the DC/AC converter.

How can derived control strategy ensure large signal stability?

To guarantee large signal stability, the derived control strategy provides important constraints on control parameters $k_p(d)$ and $k_{ip}(d)$ in the discharging state, and AC CPLs are also considered. The discharging power P_b shows a positive stability influence, and the power P of AC CPLs shows a negative stability influence. 4.2.



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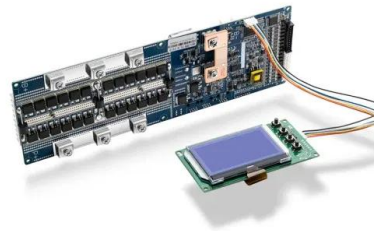
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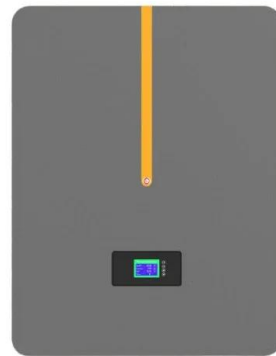
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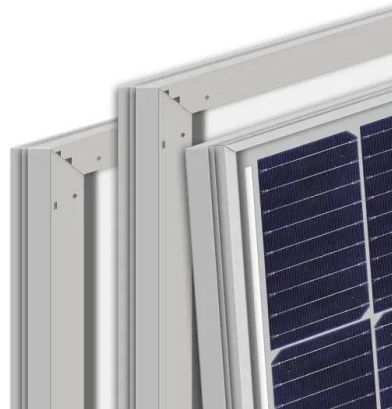
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